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STATISTICAL BULLETIN

METROPOLITAN LIFE INSURANCE COMPANY

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Diseases of Infancy and Childhood in Europe

THE adverse effect of the present war on the health of children will be felt, in varying degrees, in practically every European country. Particularly in the occupied countries, the war will leave an indelible mark on children as a result of inadequate nutrition, insufficient heating of homes, and insufficient clothing. The welfare of literally millions of children is further affected by the disruption of normal home life, by reason of the prolonged absence of heads of families who are either in military service, or are held prisoners, or pressed into labor service in enemy countries. The employment of married women in war industries abroad also works to the same end.

Recent trends, in Europe, of infant mortality and of the incidence of the common diseases of childhood are thus of timely interest. Unfortunately, complete data are not available, especially for the countries controlled by Germany, except for the early months of the war. For some countries, the facts for the capital or largest city only are known. For England, however, the picture is fairly adequate.

Infant mortality in England was appreciably higher in 1940 than in 1939, chiefly because of the sharp advance in the rate in the first quarter of the year to 77 per annum per 1,000 live births, as compared with 65 per 1,000 in the corresponding period of 1939. This rise in the first quarter was largely accounted for by the influenza epidemic that struck England in the early part of the year. In the second quarter, the infant mortality rate fell sharply, and was four percent below that of the second quarter of 1939.

In the large cities, provisional data available for the entire year show an infant mortality rate of approximately 60 per 1,000 in 1940, as compared with 53 in 1939, but on the basis of the last nine months the comparison is slightly more favorable. When figures become available for the whole country for 1940, the situation may be found to be much better than that of the large urban centers alone, where conditions resulting from the war were more abnormal than in other

parts of the country. Despite the war and the influenza epidemic in the early part of the year, last year's infant mortality figures in the cities were as good as those prevailing in England less than a decade ago.

The situation with regard to the communicable diseases of childhood in England in 1940 was, on the whole, favorable, although the trend of these diseases was distinctly upward in the last part of the year.

The most serious rise in mortality from a disease characteristic of childhood was in cerebrospinal meningitis, but, as described in the January issue of the STATISTICAL BULLETIN, this rise affected almost every European country.

England's relatively favorable record in 1940 with respect to the communicable diseases is due, in great part, to the evacuation of children from some of the large cities, despite the many public health problems raised by this measure. An extreme example of the evacuation of children today is that of London, of whose normal child population only one sixth still remained in the city last December. The closing of schools during a large part of the school year in evacuated urban areas, and for a shorter period in other cities, also helped to keep these diseases within bounds.

Air raids brought death to 2,487 children in England during 1940. This number was 11 percent of the total civilians killed in this manner. Most of these children were killed in the last four months of the year.

For the European continent, infant mortality data are fragmentary. For the first nine months of 1940 the rate in Germany (as constituted prior to 1938) was 56 per 1,000, according to a recent semiofficial report. If this report is at all accurate, infant mortality has improved markedly in that country.

Infant mortality in Paris up through March 1940 was comparatively low, but we have no facts since that date. An official statement for the unoccupied area of France, however, reports a significant rise in mortality among newborn infants in recent months. As representative of conditions in other countries, it may be noted that Amsterdam, Stockholm, and Budapest showed marked rises in infant mortality in the first quarter of 1940, as compared with the corresponding period of 1939, probably due to the influenza epidemic, and Copenhagen experienced a small increase.

The available Continental data on communicable diseases in 1940 show a mixed but generally favorable situation. Scarlet fever was of lower frequency in almost every country in 1940 than in 1939, except in Germany, where a small increase was recorded. The incidence of diphtheria fell slightly in Germany and Switzerland, but was practically unchanged in Denmark, Finland, and Yugoslavia. Cyclical increases in measles, however, were recorded in parts of western Europe, but in eastern Europe the peak of this disease was apparently reached in 1939 or in the winter of 1939-1940. As for

whooping cough, the only Continental data available show that cases of the disease were fewer in Denmark but rose sharply in Switzerland.

With the exceptions noted, the record of infant and child health seems to be remarkably good in the two chief belligerent countries and in the neutral countries for which more or less detailed records have appeared. But such records are not available for occupied areas since their occupation, and there are indications, from reliable sources, that child health in many of these countries has already been seriously affected and will deteriorate even more during the coming months. Large numbers of children in these countries are likely to suffer serious, sometimes fatal, complications of common childhood diseases which in normal and well-nourished children are seldom attended by such consequences. Despite every precaution, children in England and Germany may not escape harm if and when the war is intensified.

In this gloomy prospect, however, certain features bear hope for the future. Total war, waged against all the people, civilian and military, men, women, and children, has directed attention to the necessity of keeping up the general health and morale. Consequently, great efforts are being made to improve nutrition, for example, by the addition of vitamin B_1 to flour, and by the distribution of supplementary vitamins in capsule or other form, where these are deficient in the diet. This is supplemented, in some countries, by intensified efforts to teach nutritional principles to housewives. Permanent benefits to child health should flow from these measures in the course of time.

Quite different in nature are the benefits that may arise from the evacuation of children from endangered cities. This may foster a more tolerant attitude toward compulsory procedures of protection against communicable diseases. But even more important is the effect of removal from city slums to rural or semirural areas. Once the advantages and benefits of the new environment to children have been demonstrated, this may well prove a powerful stimulus to the resettlement of urban populations and to the gradual decentralization of the overgrown cities of Europe.

Conflicting Trends in the American Birth Rate

THE course of our birth rate in recent years is being influenced in increasing degree by the number of first births. More and more the burden of maintaining the population is being carried by the younger element. These facts, not obvious on the surface, are revealed only when the trend in the birth rate is studied in such manner as to bring out certain underlying facts.

After a long period of decline the birth rate in the United States seems to have become at least temporarily

stabilized at about 18 births per 1,000. But this simple figure of the birth rate gives only a very incomplete idea of what is actually happening. It fails to reveal certain internal diversities in trend which become evident only when the birth rates are analyzed in terms of the age of the mothers and the order of birth of the children.

For such a study it is necessary to analyze reproduction rates rather than birth rates—that is, the number of children born annually per 1,000 females at the several child-bearing ages. When the figures are computed in this manner, it is found that since 1933 there has actually been a sizable *upward* trend in the reproduction rate of women in the earlier part of the child-bearing period, reversing the trend followed up to that time; at the older ages the downward trend prevailing before 1933 has continued up to the present. Closely related to this observation regarding differential trends among the younger and the older women, respectively, is a fact revealed when the analysis is made with regard to the order of birth of the children. The sudden change from a downward to an upward trend in 1933 is very clearly evident when the reproduction rates are computed for first births only. On the other hand, when these rates are computed for children of third or higher orders, the downward movement continues through 1933 to the present. This situation is obviously related to the fact that first births occur at a younger age than later births, and that the reproductive rates of the younger women have shown an upward trend since 1933.

These facts and relations are exhibited graphically in the two panels on page 6, based on the annual records of births in the white population of the expanding birth registration area of the United States from 1920 to 1938.

Examination of the curves in the left-hand panel shows that in the years from 1920 to 1933, the reproduction rate among women in each five-year age group shown declined with great rapidity. A single exception is found in the case of women 15 to 19 years of age (dashed curve), who showed evidence of a slight upward grade from 1920 to 1927. The next two age groups, 20 to 24 and 25 to 29 years, exhibit an interesting and significant condition. Prior to 1927, it was the age group 25 to 29 that showed the highest reproduction rates of all the age groups; at 1927, the curves for the two age groups crossed, so that from then on the highest rate is that for the ages 20 to 24.

Beginning with 1933, we find, in the diagrams, the conflicting trends in the curves for the reproduction rate. In that year, it will be observed, the curves for the age groups under 30 years reached their low point and then began to move upward. Within the next five years—that is, from 1933 to 1938—the reproduction rate at ages 15 to 19 years increased by 13 percent, at ages 20 to 24 by 14 percent, and at ages 25 to 29 by 7 percent. The

curves for the higher ages meanwhile continued to move to lower levels; at ages 35 and over, the points for 1938 are the lowest on the curves. Thus the relatively stable birth rate which we have been experiencing in recent years hides two opposing trends—an increase in the reproductive rate of young women, and a decrease among women at the higher ages.

The curves in the right-hand panel relate to reproduction rates according to order of birth. The reproduction rate for a particular order of child, and for a given calendar year, is computed by tracing a cohort of 1,000 women through their entire reproductive period, and counting all the children of that particular order of birth which would be born to these women in the course of their reproductive period—say, ages 15 to 55—at the age-specific rates prevailing in the calendar year under consideration.

The trends of these curves of reproduction rates according to order of birth are, naturally, in many respects similar to those showing reproduction rates according to age. For in these curves of reproduction rates, also, each moves sharply downward until 1933, when the situation changes and opposing trends again become evident. In the case of the first child, the curve rose from a rate of 600 per 1,000 in 1933 to a rate of 770 in 1938—a point exceeded in the earlier period only in one calendar year. The rise in the frequency of second births was not quite so marked—from a rate of 450 per 1,000 in 1933 to a point of 500 in 1938. For the third child, the downward trend of the curve was barely interrupted in 1933 and again in 1938, while the curves for the higher orders proceeded without break to their lowest point in 1938, the latest year shown.

That the reproductive rate of first births should be moving upward since 1933 is not surprising, when it is recalled that the marriage rate has also been increasing since then. In a study based on data for New York State for the period 1919 to 1937, it was shown that, with few exceptions, an increase in the marriage rate from one year to another was followed, with a lag of one year, by a corresponding increase in the birth rate of first children.*

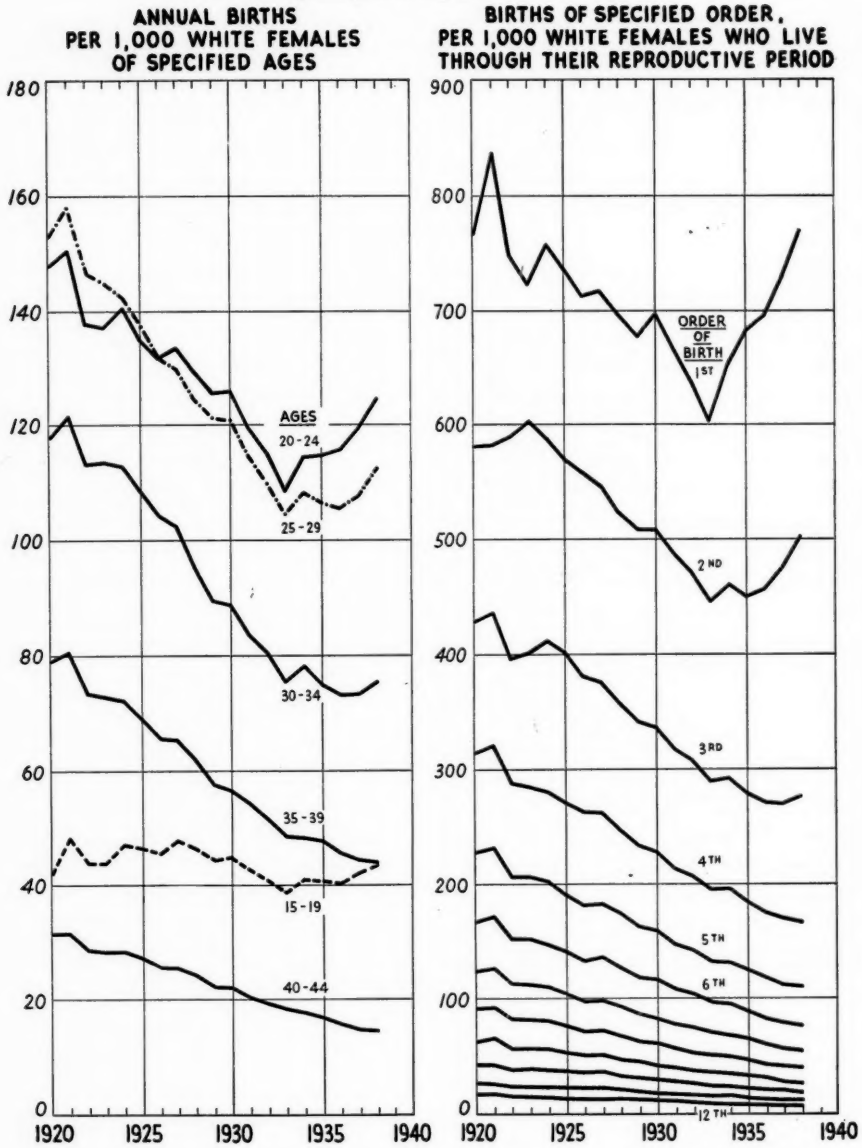
There has, therefore, been a change in the pattern of American reproductivity during the last two decades. There has been an increase in the proportion of first births to total births each year, with a corresponding increase in the proportion of the births which occur among women at the younger ages. Whereas the ratio of first births to total births increased slowly from 27 percent in 1920 to 32 percent in 1933, the figure rose to 38 percent by 1938.

Our figures and diagrams bring us up to the year 1938. The question immediately arises whether the upward trend in the reproduction rates of younger women is a temporary affair, or whether we may expect it

*Statistical Bulletin, May 1939, page 6.

TRENDS IN AMERICAN REPRODUCTIVITY

United States Expanding Birth Registration Area, 1920 - 1938



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to continue. The fact that the marriage rate has been on the upgrade recently might lead us to expect this trend in reproduction rates to last at least a little while longer. Perhaps that is all that we can reasonably expect, but even so it will help to arrest the previous downward movement which, if continued, would lead to a definitely serious situation. As regards the continued downward trend of reproductivity among the older women, and in the proportion of children of higher orders, this is clearly the reflection of the modern tendency towards smaller families. How long this trend will continue, and how far it will go, is one of the seriously disturbing questions of modern demography.

Pneumonia Control—Another Public Health Triumph

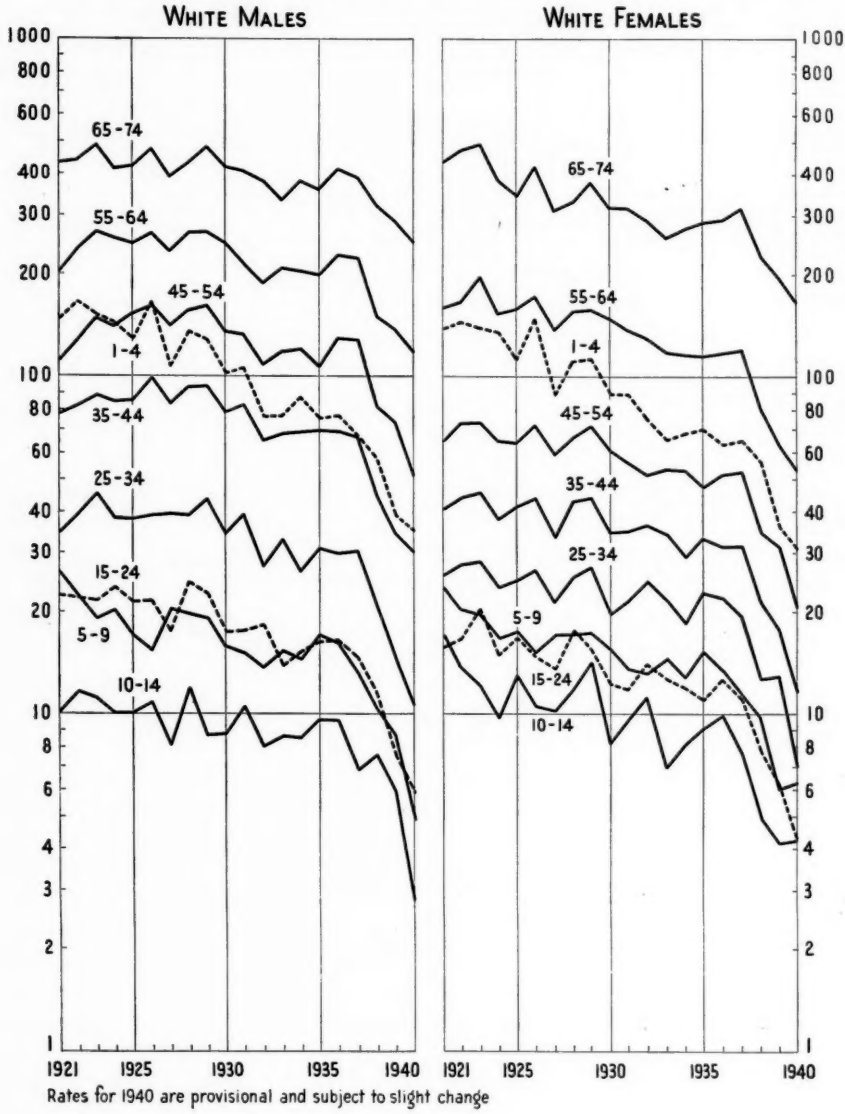
PNEUMONIA is in hurried retreat before the advance of modern medicine. Through the use of drug and of serum treatment, the mortality from pneumonia has been rapidly reduced, and there is every indication that the disease will be curbed still further in the near future. How greatly the situation has changed from the time, only two short decades ago, when the Metropolitan Life Insurance Company, after the devastating pandemic of 1918–1919, organized the Influenza-Pneumonia Commission to study ways to control this disease! In the brief interval since then the work done under the direction of this Commission, and by other organizations and individuals, has met with signal success. In fact, the development of antiserum and of chemotherapy ranks among the great achievements in medical history. Fortunately, investigations along these lines are still proceeding apace, and there is every indication that these specific weapons against pneumonia will become even more effective.

Comparable mortality data for pneumonia are available only for the past two decades, and during this period the general trend of the death rate from this cause has been downward. The character of the decline, however, has changed markedly since the development of the newer methods of treatment. Prior to 1937 the pneumonia mortality curve, while tending toward lower levels, did so hesitatingly and showed considerable fluctuation. Since then the curve has declined sharply and continuously.

The benefits of the recent advances in pneumonia therapy are by no means limited to any one group of the population; both men and women at every age period of life have shared in the gains. This is abundantly evident from the chart on page 8, which is drawn on a logarithmic scale in order to show the relative declines among the various age groups. The sharp drop in the pneumonia death rate since 1937 is evident at every age period in each sex, giving added weight to the

MORTALITY FROM PNEUMONIA

Death Rates per 100,000 White Males and White Females, By Age
Industrial Department, Metropolitan Life Insurance Company, 1921 to 1940



Rates for 1940 are provisional and subject to slight change

belief that present levels of mortality are not just the result of a fortunate temporary situation, but rather that pneumonia control has now reached a new and more effective stage. Less than 20 years ago not a single five-year age group among these policyholders registered an annual death rate of less than 10 per 100,000; by 1940 the pneumonia mortality among white males in the age range 5 to 24 years and among white females in the ages 5 to 34 years, had fallen to seven, or less than seven, per 100,000, a truly remarkable improvement.

Supplementing the chart, the table below shows the percent decline in the pneumonia death rate, by age, between the first three and the last three years of the series. Among white males at ages 1 to 74 years, the mortality from this disease was cut to less than half during this period, from 81.9 per 100,000 in 1921–1923, to 38.8 in 1938–1940, a drop of 53 percent. The reduction in mortality among these policyholders has been large in every age group, the greatest gains being made at the younger ages. The largest decline was in the age group 1 to 4, and amounted to no less than 72 percent between 1921–1923 and 1938–1940; even the smallest decline, at ages 65 to 74 years, was 37 percent. Among white females the drop in the pneumonia death rate was even more marked than that among males at almost every period

Averages of Annual Death Rates per 100,000 for Pneumonia. White Persons, by Sex and Age Periods. Metropolitan Life Insurance Company, Weekly Premium-Paying Business, Industrial Department, 1938–1940 and 1921–1923 Compared

Age Period, Years	Death Rates per 100,000				Percent Decline 1938–1940 Since 1921–1923	
	White Males		White Females			
	1938 to 1940	1921 to 1923	1938 to 1940	1921 to 1923	White Males	White Females
1 to 74*	38.8	81.9	23.9	63.9	52.6	62.6
1 to 4	43.5	155.2	41.0	139.2	72.0	70.5
5 to 9	7.9	22.7	7.3	21.2	65.2	65.6
10 to 14	5.4	10.9	4.5	14.3	50.5	68.5
15 to 19	7.6	20.9	5.3	14.9	63.6	64.4
20 to 24	8.8	23.1	6.9	20.3	61.9	66.0
25 to 34	15.1	39.5	10.8	27.3	61.8	60.4
35 to 44	36.2	82.0	16.9	43.5	55.9	61.1
45 to 54	68.4	128.0	28.9	69.9	46.6	58.7
55 to 64	133.3	236.7	65.8	173.3	43.7	62.0
65 to 74	285.5	452.9	198.1	466.1	37.0	57.5

*Standardized for age.

Note—Rates for 1940 are provisional and subject to slight change.

of life, especially in the ages beyond 45 years.

While much has been accomplished to curb the mortality from pneumonia, much still remains to be done. In the general population of the United States the disease in its various forms was responsible for more than 77,000 deaths in 1939, and this high figure does not include the many thousands of deaths allocated to other titles in which pneumonia was a contributory cause. The toll that pneumonia has taken year after year in the past has been so high that, even after the remarkable successes of recent years, the disease continues to be among the important killers.

The outlook for the future is encouraging. Not only have effective methods been developed within recent years for treating pneumonia, but work goes on in developing and testing a preventive vaccine. While the effectiveness of immunization has not yet been established, there is good reason to expect eventual success. Similarly, investigators are studying methods of protecting individuals against influenza, which is often the forerunner of pneumonia. These efforts, too, show promise of ultimate success.

Health Record for February 1941

THE health picture for February among the many millions of Metropolitan Industrial policyholders follows the same general pattern as that for the month before: a somewhat higher death rate for this year than last, reflecting in considerable measure the toll taken by the influenza epidemic in Canada.

For the first two months of the current year, the mortality among the Canadian Industrial policyholders was 7.3 per 1,000, or 27 percent above that for the like period of 1940. The death rate from influenza and pneumonia was up 73 percent. In addition, the epidemic carried off prematurely many Canadians with chronic ailments. Thus, the death rate from tuberculosis to the end of February was 35 percent higher this year than last, and from the cardiovascular-renal diseases as a group, 29 percent higher. The situation among the Canadian policyholders has been slowly improving, however, the death rate having declined in the current year from 7.4 per 1,000 in January, to 7.1 in February, whereas the curve last year rose between these two months.

For the total Industrial Department, the death rate to the end of February was 8.66 per 1,000, as compared with 8.50 in 1940. Although the rate from all causes together has increased, a number of individual diseases show a better record this year than last—namely, tuberculosis, syphilis, diarrhea and enteritis, appendicitis, and the puerperal conditions.

The following table shows the mortality among Industrial policyholders for February 1941, January 1941, and February 1940, together with the death rates for the first two months of each year.

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Death Rates per 100,000 Policyholders from Selected Causes. Industrial Department. Weekly Premium-Paying Business*

Causes of Death	Annual Rate per 100,000 Policyholders*				
	February 1941	January 1941	February 1940	Year to Date: End of February	
				1941	1940
All Causes—Total	891.6	843.2	871.7	865.7	850.0
Typhoid fever	.6	.4	.2	.5	.4
Measles	.6	.3	.3	.4	.4
Scarlet fever	.7	.3	.8	.5	.8
Whooping cough	1.7	1.2	1.6	1.4	1.5
Diphtheria	.7	.7	1.5	.7	1.5
Influenza	28.0	19.1	19.4	23.2	16.5
Pneumonia (all forms)	62.5	50.9	63.9	56.3	58.3
Tuberculosis (all forms)	46.3	41.9	46.1	44.0	45.1
Tuberculosis of respiratory system	42.5	38.2	42.9	40.2	41.5
Syphilis	12.5	9.6	12.1	11.0	12.4
Cancer (all forms)	102.0	105.3	103.6	103.8	102.5
Diabetes mellitus	36.2	31.7	32.8	33.8	31.3
Cerebral hemorrhage	68.2	65.7	68.3	66.9	66.7
Diseases of the coronary arteries	60.1	54.9	50.6	57.3	52.4
Angina pectoris	3.1	3.4	4.0	3.3	3.7
Diseases of the heart (other forms)†	193.2	178.4	186.0	185.3	178.1
Diarrhea and enteritis	2.8	3.1	3.5	3.0	3.6
Appendicitis	8.5	6.8	8.8	7.6	8.6
Chronic nephritis	60.7	56.4	61.1	58.4	60.9
Puerperal state—total	4.9	3.4	4.1	4.1	4.6
Suicides	7.8	8.3	7.5	8.1	7.6
Homicides	3.0	3.5	3.0	3.3	3.0
Accidents—total	44.7	51.3	46.3	48.2	48.3
Home accidents	11.7	13.3	14.8	12.6	15.4
Motor vehicle accidents	16.5	23.5	15.7	20.2	17.3
Automobile accidents‡	15.8	22.2	14.8	19.2	16.1
All other causes of death	142.8	146.7	146.3	144.8	142.0

*The rates for 1940 and 1941 are subject to slight correction, since they are based on provisional estimates of lives exposed to risk.

†Excludes pericarditis, acute endocarditis, and acute myocarditis.

‡Excludes collisions between automobiles and railroad trains or streetcars.

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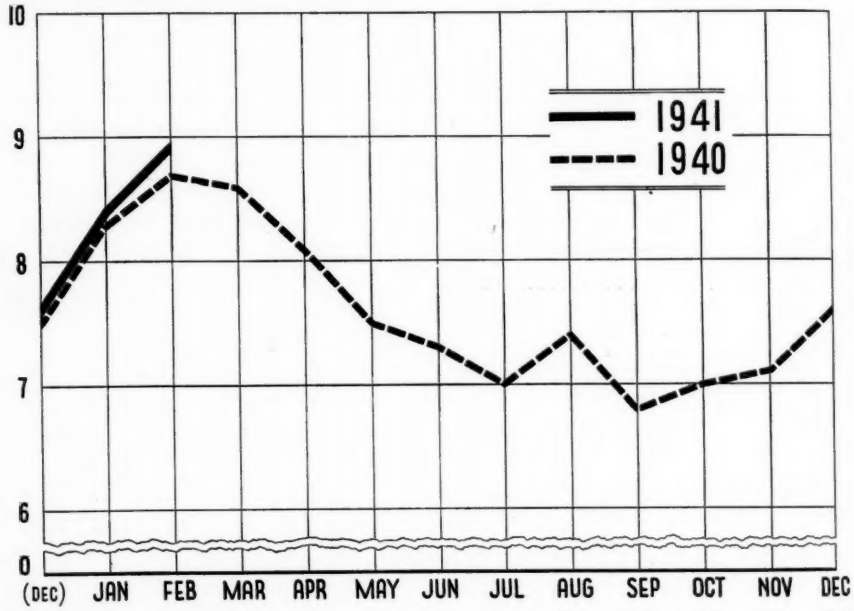
MORTALITY FROM ALL CAUSES

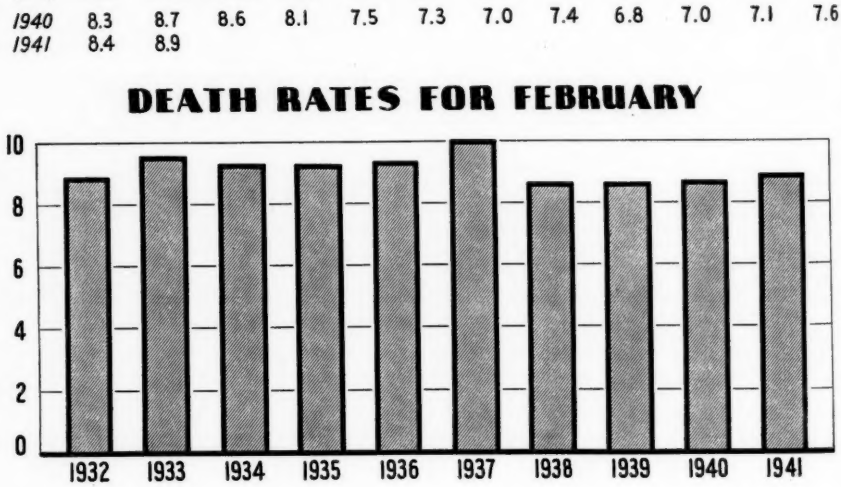
METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT, WEEKLY PREMIUM-PAYING BUSINESS

DEATH RATES PER 1,000 · ANNUAL BASIS



(DEC)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1940	8.3	8.7	8.6	8.1	7.5	7.3	7.0	7.4	6.8	7.0	7.1	7.6
1941	8.4	8.9										

DEATH RATES FOR FEBRUARY



Rates for 1940 and 1941 are provisional.

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